

## **DoD Space Planning Criteria for Health Facilities**

### **Radiology and Nuclear Medicine**

#### **5.4.1. PURPOSE AND SCOPE:**

This section provides guidance for the space planning criteria for radiology and nuclear medicine activities in DoD medical facilities.

The Radiology Department as used in these criteria includes all diagnostic-imaging modalities (i.e. Radiology, Fluoroscopy, Computed Tomography, Magnetic Resonance Imaging (MRI), Ultrasound, etc.). Criteria is provided for the radiology service and for satellite locations such as emergency medicine, orthopedics, etc. It does not include such systems as cardiac catheterization and urological systems normally found in other departments. These systems will be found in the space planning criteria for the applicable department.

The Radiotherapy Department in these criteria includes all treatment modalities (i.e. Linear Accelerator, etc.).

The Nuclear Medicine Service includes provision of space for specialized measurement equipment and environments necessary to use radioisotopes in the diagnosis and treatment of patients.

#### **5.4.2. DEFINITIONS:**

##### **Radiology:**

**Angiography System** - A specialized radiographic/fluoroscopic system with expanded capabilities for performing angiography procedures.

**Computed Radiography (CR)** - Using a traditional exposure unit that uses film, a special reusable cassette captures the image and a CR reader unit digitizes the image and sends it to the appropriate workstation or to storage.

**CT Scanner** - A Computed Assisted Tomography Scanner (CT) is an x-ray system that produces an axial (cross sectional) image of the anatomy being studied. The CT image is a computer calculated composite of numerous short exposures taken from various angles in a circle around the anatomy of interest. As the image is computer calculated, an image or a series of images may be manipulated to produce different views of the area of interest and to "window" out interfering structures such as bone. The "window" capability allows the radiologist to selectively view either dense tissues such as bones or to view diffuse tissues such as the heart or brain.

**Direct Radiology** - An image is taken, verified and transmitted within the exposure room (R/F rooms).

**Diagnostic Radiology** - There are three general systems grouping, although these may be mixed:

1. A film based system with darkrooms and film storage has been the conventional system.
2. A totally digital system is one in which the radiology exposure device generates a digital image that can be:
  - a. read as a digital image or stored in digital form immediately, or
  - b. stored "film" (hard-copy).
3. A computed radiology system is one in which a special cassette is substituted for the film cassette. This special cassette is then placed in a CR reader and a digital image is generated.

**Diagnostic Room** - Any room in the Radiology Department containing imaging equipment such as radiographic, radiographic/fluoroscopic, MR, angiography, CT, ultrasound system, etc.

**Digital Radiography** - The capture or conversion of radiography images in a digital format.

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**General Purpose Radiograph** - A radiographic system designed primarily to perform general radiographic procedures.

**Magnetic Resonance Imaging (MRI)** - is a technique to produce computer calculated images of human anatomy using a very high strength magnetic field. The scanner gantry incorporates a high strength magnet, radio frequency transmission coils, and signal acquisition coils.

**Picture Archiving and Communications System (PACS)** - A PACS consist of workstations for interpretation; imaging modalities that gather Radiography, Fluoroscopy, Angiography, Ultrasound, Nuclear Medicine, CT, and MRI data; a web server for distribution; printers for film (which must still be generated, in limited amounts, for the use of those without access to the network); image servers to transfer and hold information within the PACS; an archive of off-line information. A network is needed to reach each of these devices.

**Radiographic/Fluoroscopic System** - A system designed to produce radiographs or real time motion, plus real time images via direct viewing or a television monitor. The real time images can be recorded for later viewing.

**Specialized Radiographic System** - A radiographic system designed primarily to perform a specific type of radiographic procedure.

- a. **Dedicated Chest System** - A radiographic system designed to perform upright chest examination.
- b. **Tomography System** - A radiographic system designed to perform laminography studies. This is an option to a radiographic/fluoroscopic room.
- c. **Mammography System** - A radiographic system designed primarily to perform mammographic examinations.

**Nuclear Medicine** (the following terms are generally used in reference to Nuclear Medicine and Radiotherapy services):

**Cold** - Refer to an area, which should be free of radiation. The designations of hot and cold are made to separate potentially radioactive patients from other patients.

**Bone Densitometer** - Measure bone mineral density. It will also compare this measurement to a reference population based on age, weight, sex, and ethnic background.

**Dosimetrist** - A member of the radiation oncology team who has knowledge of the overall characteristics and clinical relevance of radiation oncology treatment machines and equipment, is cognizant of the procedures commonly used in brachytherapy and has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the medical physicist and the radiation oncologist.

**Dual Photon Bone Mineral Absorptiometry Scanning Room** - Room for performing bone densitometry (osteoporosis tests)

**Hot** - Refers to an area where radiation may be present. For example a “hot” toilet is reserved for patients who have been given a radioactive substance and who are considered radioactive themselves. There are also “hot” waiting rooms. (See Cold).

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**Therapy Planning Room:** Area where computerized imaging is used to determine radiation dosage, angles and type of molds required for individual patient treatment.

**Linear Accelerator (LINAC) -** In the health care setting, a linear accelerator is the device most commonly used for external beam radiation treatments for patients with cancer. It delivers a uniform dose of high-energy x-ray to the region of the patient's tumor. These x-rays can destroy the cancer cells, while sparing the surrounding normal tissue. The linear accelerator uses microwave technology to accelerate electrons and then allows these electrons to collide with a heavy metal target. As a result of these collisions, high energy x-rays are scattered from the target. A portion of these x-rays is collected to form a beam that matches the size and shape of the patient's tumor. The beam comes out of a part of the accelerator called a gantry, which rotates around the patient.

**Nuclear Medicine** - A medical specialty that uses liquid and gaseous radioactive materials (or radiopharmaceuticals) to diagnose and treat various conditions. Nuclear Medicine is also the diagnostic (in vivo and in vitro) and therapeutic use of unsealed radioisotopes (gases and liquids).

**Radiopharmaceuticals-** Pharmaceuticals that have a radioactive component. These localize in the body based on their physical or chemical properties. The radiopharmaceuticals used in diagnostic nuclear medicine emit gamma rays that can be detected externally by special types of cameras: gamma or TET cameras. Therapeutic nuclear medicine uses substances that emit beta radiation, which can kill targeted cells within the body.

**Radiotherapy** – also called radiation therapy, is the treatment of cancer and other diseases with ionizing radiation. This is a high-energy ray, usually x-rays, used to kill cells, usually cancer cells.

**Positron Emission Tomography (PET)-** Produces high energy, 3-D computer-reconstructed images measuring and determining the function or physiology in a specific organ, tumor, or other metabolically active site.

**Picture Archiving and Communications System (PACS)** - A PACS consist of workstations for interpretation; imaging modalities that gather Radiography, Fluoroscopy, Angiography, Ultrasound, Nuclear Medicine, CT, and MRI data; a web server for distribution; printers for film (which must still be generated, in limited amounts, for the use of those without access to the network); image servers to transfer and hold information within the PACS; an archive of off-line information. A network is needed to reach each of these devices.

**Scanning Rooms** - "Scanning room" is a generic term used in nuclear medicine for programming purposes. The specific type of scanning equipment, i.e., gamma scintillation camera or PET camera may be included within the same area. Note that scanning is a widely used term and that there are other procedure that are not in nuclear medicine that are scanning procedures - CT Scanners, MRI are examples.

**Studies- Needs definition.....**

**Thyroid Uptake Room** - This room is specifically assigned to use isotopes to study problems of the thyroid gland.

#### **5.4.3. POLICIES:**

##### **Radiology:**

The radiology department (diagnostic radiology, radiotherapy and nuclear medicine) should be collocated.

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A Cardiac Catheterization Laboratory can also perform angiography procedures. Under special study, a combined radiographic/fluoroscopic/angiographic room may be programmed for special procedures including the production of single plane angiography.

Mobile x-ray equipment storage areas will not normally be provided in the Radiology department. This equipment should be stored in the area where it is used.

#### **5.4.4. PROGRAM DATA REQUIRED:**

- How many FTE radiologists are projected?
- How many NCOIC/LCPO/LPO/SMT are projected?
- How many officers or officer equivalents are projected?
- How many staff will require a private office?
- How many staff will require a cubicle?
- How many staff will require a lockers?
- How many FTEs on peak shift are projected?
- Will conventional films be stored in this clinic?
  - Will fixed shelving be used?
  - Will moveable shelving be used?
- How many mammography studies performed annually?
- Will stereotactic mammography studies be performed?
- Will bone densitometry studies be performed?
- How many radiographic studies are projected annually?
- How many fluoroscopic studies are projected annually?
- How many chest imaging studies are projected annually?
- How many ultrasound studies are projected annually?
- Will a darkroom be required?
  - How many diagnostic rooms will be supported by this darkroom?
- Will daylight processing be required?
  - How many diagnostic rooms will be supported by this daylight processor?
- Will angiography be performed in this clinic?
  - How many angiographic rooms will be required?
- Will CT scanning be performed?
  - How many annual CT studies will be performed?
- How many MRI studies will be performed annually?
- Will there be vending machines in the staff lounge?
- How many Quality Assurance FTEs are projected?
- How many Radiology Transcriptionists FTEs are projected?
- Will there be a Phase II training program?
  - How many Phase II Instructor FTEs are projected?
  - How many Phase II students are projected?
- How many mobile radiographic units will be stored in Radiology?
- How many mobile C-Arm radiographic units will be stored in Radiology?
- Will conventional film record storage use fixed or mobile shelving?
- Will the radiologist provide Tele-Radiology services?
  - Will Tele-Radiology services require a separate archive/storage room?
- Will digital image storage be located in the Radiology Department?
- Will there be an On-Call Room?
- Will there be a Residency Program?
  - Will there be a Residency Program Director?
  - Will there be a Residency Program Secretary?
  - How many Residents are projected?
  - How many Residency Staff require a private administrative office?

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How many Residency Administrative Staff cubicles are required?  
 Will there be a Nuclear Medicine Department?  
 Is a special scanning unit projected?  
 How many PET and PET-CT units are projected?  
 Will radiotherapy be performed?

#### **5.4.4. PROGRAM DATA REQUIRED: Continued**

Is a whole body scanning unit projected?  
 Is a Radio-immunoassay laboratory projected?  
 How many FTE secretaries are projected?  
 How many FTE providers are projected?  
 How many programmed trainees are projected?  
 Will there be a Radio-Immunoassay Laboratory Director?  
 How many FTE Physicists are projected?  
 How many FTE Radio-Pharmacists are projected?  
 How many FTE Chief Technicians are projected?  
 How many administrative staff require a dedicated cubicle?  
 Will Nuclear Medicine Providers review Tele-Nuclear Medicine studies?  
 How many total FTE staff are projected in Nuclear Medicine?  
 How many FTE staff will require a property locker?

**Note to Programmer:** A decision is required concerning the type of system that will be used in the radiology service. There are three general systems grouping, although these may be mixed. A film based system with darkrooms and film storage has been the conventional system. A totally digital system is one in which the radiology exposure device generates a digital image that can be read as a digital image or stored in digital form immediately. A computed radiology system is one in which a special cassette is substituted for the film cassette. This special cassette is then placed in a CR reader and a digital image is generated.

#### **5.4.5. SPACE CRITERIA:**

<b>RECEPTION AREAS</b>				
Waiting Room	WRC01	9.29	100	Clinic minimum. Add 80nsf for each additional Diagnostic Room greater than three.
		18.58	200	Hospital minimum. Add 80nsf for each additional Diagnostic Room greater than three.
Clinic Reception	RECP1	13.01	140	Minimum. Provide an additional 10 nsf for every diagnostic room over 3. Maximum of 200 nsf.
Patient Education Kiosk/Alcove	CLSC1	2.78	30	One per clinic.
Public Toilets	N/A	N/A	N/A	Space provided in Common Areas Section 6.1.

  

<b>MAIN RADIOLOGY</b>				
Patient Sub-waiting Area	WRC01	5.57	60	One per each four Diagnostic Room.
Patient Toilet	TLTU1	4.65	50	See Section 6.1.
Patient Litter Holding	WRL01	5.57	60	Hospital only. One per each four Diagnostic Room.
General Radiographic	XDR01	29.73	320	Per room authorized. See formula in Section 5.4.6 to determine number of rooms.

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<b>MAIN RADIOLOGY Continued</b>				
Radiographic Chest	XDCS1	23.23	250	Per room authorized. See formula in Section 5.4.6 to determine number of rooms.
Radiographic/Fluoroscopic (GP)	XDRF1	29.73	320	Per room authorized. See formula in Section 5.4.6 to determine number of rooms.
Dedicated Toilet	TLTU1	4.65	50	One per Radiographic/Fluoroscopic Room.
Darkroom Film Processing (GP)	XFP01	9.29	100	X-ray film processing - one processor. One room for equal to or less than three Diagnostic Rooms.
Darkroom Film Processing	XFP02	11.15	120	X-ray film processing - two processors. One room for greater than three Diagnostic Rooms.
Daylight Film Processing (GP)	XFP03	9.29	100	One per four Diagnostic Rooms.
Mammography (GP)	XDM01	11.15	120	Space per Mammography Room. See formula section 5.4.6 to determine number of rooms.
Mammography, Stereotactic	XDM02	15.80	170	If in clinic concept of operations.
Mammography Processing (GP)	XDMP1	10.22	110	Minimum. One per two Mammography Rooms.
Ultrasound (GP)	XDUS1	16.72	180	Space per Ultrasound Room. See formula Section 5.4.6 to determine number of rooms.
Dedicated Ultrasound Toilet	TLTU1	4.65	50	One per Ultrasound Room.
Bone Densitometer	XDBD1	11.15	120	If in clinic concept of operations.
Dressing Room/ Cubicle	DR001	4.65	50	One per General Radiographic, Radiographic/Fluoroscopic Room, Ultrasound Room

#### **SPECIALIZED DIAGNOSTIC ROOMS**

##### **ANGIOGRAPHY**

Angiographic Procedure Room (3D GP)	XABP1	83.62	900	Special justification required. To be used only when the Angiographic Procedure Room will also be used for procedures.
Patient Preparation	ORPP1	11.15	120	Two per Angiographic Procedure Rooms.
Medication Preparation Station	MEDP1	5.57	60	One per Angiographic Procedure Room.
Angiographic Control Room	XACR1	22.30	240	Minimum. Add 80 nsf per Angiographic Procedure Room greater than one.
Angiographic System Component Room	XACV1	9.29	100	One per two or less Angiographic Procedure Rooms. Greater than two add another room.
Viewing/Consultation Room	XVC01	9.29	100	One per two or less Angiographic Procedure Rooms. Greater than two add another room.
Sterile Supply	ORCW1	9.29	100	One per two or less Angiographic Procedure Rooms. Greater than two add another room.
Angiographic Instrument Room	XAIR1	9.29	100	One per Angiographic Procedure Room.
Equipment Storage	SRS01	12.54	135	Minimum. One per every two Angiographic Procedure Rooms.
Scrub Area	ORSA1	5.57	60	Minimum. (For two scrub sinks.) One per two procedure rooms.

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#### COMPUTED TOMOGRAPHY

CT Scanning Room	XCTS1	27.87	300	Per each CT Scanning Room. See formula Section 5.4.6 to determine number of rooms.
CT Control Room	XCTC1	11.15	120	One per scanning room. Includes computer equipment.
Independent Display Console	XCTI1	11.15	120	One per scanning room.
Patient Litter Holding	WRL01	5.57	60	One per scanning room.
Patient Sub-Waiting	WRC01	5.57	60	One per scanning room.
Patient Preparation	ORPP1	11.15	120	One per scanning room.
Medication Preparation Station	MEDP1	5.57	60	One per scanning room.
Patient Toilet (wc, lav)	TLTU1	4.65	50	Patient toilet must be located next to CT room

#### MAGNETIC RESONANCE IMAGING (MRI)

<b>MRI PATIENT AREAS</b>				
Reception	RECP1	13.01	140	One per MRI suite.
MRI Scanning Room	XMRS1	46.46	500	Space per scanning room. See formula section 5.4.6 to determine number of suites.
MRI Control Room	XMRC1	9.29	100	One per scanning room.
MRI System Component Room	XMRC2	13.94	150	One per scanning room.
Dressing Room/Cubicle	DR001	4.65	50	Provide two booths per scanning room.
Patient Litter Holding	WRLO1	5.57	60	One per scanning room.
Sub-Waiting	WRC01	5.57	60	One per every two scanning room.
Patient Toilet	TLTU1	4.65	50	One per every two scanning room.

#### MRI STAFF AND SUPPORT AREAS

Crash Cart Alcove	RCA01	1.86	20	One per clinic.
MRI Viewing Room	XMRV1	13.94	150	One per MRI suite.
MRI Gas Storage (Cryogen Storage)	SRGC1	5.57	60	Exterior room. One per MRI suite.
	SRGC2			Interior room. One per MRI suite.
MRI Equipment Room	XMRE1	26.01	280	One per MRI suite.
Litter-Wheelchair Storage Alcove	SRLW1	3.72	40	One per MRI suite.
Soiled Linen	UTLC1	7.43	80	One per MRI suite.
Storage Room	SRS01	3.72	40	One per MRI suite.

#### STAFF AND ADMINISTRATIVE AREAS

Staff Radiologist	OFDR1	11.15	120	One per projected FTE.
NCOIC/LCPO/LPO/SMT	OFA01	11.15	120	Standard Furniture. One per clinic
	OFA02			System Furniture. One per clinic.
Quality Assurance Office	OFDR1	11.15	120	One per Projected QA staff.
Mammography Scheduler/Tracking Office	OFA03	5.57	60	One per radiology clinic with mammography services.
Transcription work area	OFA03	5.57	60	Per FTE projected.

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#### STAFF AND ADMINISTRATIVE AREAS Continued

Administrative Cubicle	OFA03	5.57	60	Per assigned FTE, see Section 2.1. Provide 60 nsf for each full time personnel who require office space.
Private Office	OFA01	11.15	120	One per projected FTE that requires a private office with standard furniture.
	OFA02	11.15	120	One per projected FTE that requires a private office with systems furniture.
Phase II Instructor Office	OFA01	11.15	120	One per projected Phase II instructor. Standard Furniture.
	OFA02	11.15	120	One per projected Phase II instructor. Systems Furniture.
Phase II Personal Property Locker Area	LR001	1.86	20	Minimum. Two nsf per student. Phase II technician teaching program required.
Copy room	RPR01	9.29	100	For Copier/Fax/Mailbox distribution
Radiology Conference / Classroom	CRR01	23.23	250	One per department with more than 4 diagnostic rooms.
Staff Lounge	SL001	13.01	140	Minimum, if at least 10 FTEs on peak shift Add 5 nsf for each peak shift FTE over 10. Maximum size not to exceed 300 nsf. Add 20 nsf if vending machines are included.
Personal Property Lockers (GP)	LR001	9.29	20	Personal property lockers. See section 6.1
Staff Toilets (GP)	TLTU1	5.57	50	Minimum for total clinic staff of at least 10. See Section 6.1 for increase in size and for male/female breakdown.

#### CLINIC SUPPORT AREAS

Crash Cart Alcove	RCA01	1.86	20	One per clinic.
Litter and Wheelchair Storage	SRLW1	2.32	25	One per two Diagnostic Rooms.
Mobile Rad Unit Storage Alcove	XRM01	3.72	40	One per mobile radiographic unit stored in Radiology.
Mobile C-Arm Storage Alcove	XRM02	3.72	40	One per mobile C-Arm radiographic unit stored in Radiology.
Film Sorting Area	XFSA1	13.94	150	One area per darkroom.
Film File Storage - Fixed Shelves	XFFA1	23.23	250	Required if any conventional (film based) radiology is included. Add 50 nsf for each diagnostic room greater than four.
Film Files Storage - Mobile Shelves	XFFA2	23.23	250	Required if any conventional (film based) radiology is included. Add 50 nsf for each diagnostic room greater than four.
Digital Image Storage	XFDS1	9.29	120	Minimum. Add 10 nsf per diagnostic rooms greater than five. This room may be located in Information Management or Radiology, but not in both
Quality Assurance Area (GP)	XVC01	11.15	120	One per projected Quality Assurance FTE.
Non-Residency Viewing/Consultation Area	XVC01	11.15	120	Minimum. Provide one per two diagnostic rooms. Size of viewing area is the same for film or digital viewing.



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#### CLINIC SUPPORT AREAS Continued

Residency Viewing/Consultation Area	XVC01	23.23	250	One per department. Minimum of 60 nsf per diagnostic room, whichever is greater.
Tele-Radiology	XVC01	20.91	225	Required if in clinic concept of operations. This is in addition to standard viewing room. Add additional 100 nsf if separate archive/storage room required.
On Call Room	DUTY1	11.15	120	If in clinic concept of operations.
On Call Toilet/Shower	TLTS1	5.57	60	
Tele-Rad Digital Image Storage	XFDS1	9.29	100	May be added to Main Radiology Digital Storage Room during design.
Equipment storage	SRS01	9.29	100	One per clinic
Linen Alcove	LCCL1	.93	10	One per Diagnostic Room. Distribute in diagnostic areas.
Clean Supply & Equipment Area	SRSE1	9.29	100	Depends on number of Diagnostic Rooms. 100nsf <= 2; 120nsf = 3; 160nsf = 4; 200nsf =< 5
Trash and Linen Collection	UTLC1	7.43	80	One per clinic
Dedicated Janitors' Closet	JANC1	3.72	40	One for Radiology Department.

#### Functions which are required for Residency Education in Radiology:

Residency Program Director	OFDR1	11.15	120	One per Residency Program Director.
Secretary with visitor waiting.	SEC01	11.15	120	One per projected FTE secretary.
Private Office	OFDR1	11.15	120	One per projected FTE that requires a private office.
Administrative Cubicle	OFA03	5.57	60	Provide 60 nsf per projected administrative personnel requiring a dedicated cubicle.
Resident's Cubicle	OFA03	5.57	60	One per projected resident.
Residency Teaching Files	FILE1	9.29	100	One per Residency Program.
Residency Library	LIBB1	13.01	140	One per Residency Program. May be combined with conference room.
Conference Room (GP)	CRR01	37.16	400	One per Residency Program or Phase II technician training program.
Preceptor/Consult Rooms	OFDC1	11.15	120	Minimum of one. One per ten staff physicians. May use OFD01/OFDO3 if within clinical area.

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#### NUCLEAR MEDICINE:

##### **NUCLEAR MEDICINE PATIENT AREAS Special Study Required to Justify.**

Reception	RECP1	13.01	140	One per Nuclear Medicine clinic. Can be collocated with Main Radiology.
Waiting Room "Hot"	NMWR1	9.29	100	Minimum. Add 16 nsf for each additional nuclear imaging room above six.
Toilet "Hot"	TLTU1	4.65	50	Minimum. See Section 6.1. One per "Hot" waiting area. Consider Shielding
Waiting Room "Cold"	WRC01	11.15	120	Minimum. Add 16 nsf for each additional imaging room above six.
Toilet "Cold"	TLTU1	4.65	50	Minimum. See Section 6.1. One per "Cold" waiting area.
Inpatient Holding	WRL01	9.29	100	One per clinic.
Dressing Room/Cubicle	DR001	4.65	50	Minimum of one cubicle. One per four nuclear imaging rooms.
Patient Toilet/Shower	TLTS1	5.57	60	One per clinic. (one wc, one lav, one shower)

##### **NUCLEAR MEDICINE TREATMENT ROOMS**

General Scanning	NMGS1	33.45	360	Collimator cart storage included
Computer Room	NMCR1	11.15	120	One per clinic.
Special Scanning	NMSS1	37.17	400	This space is adequate for dynamic cardiac studies and tomography systems.
Whole Body Scanning	NMWB1	37.17	400	If in clinic concept of operations.
Treadmill Room	OPTM1	20.44	220	One per clinic.
PET-CT Scanner	NMSS1	41.81	450	If in clinic concept of operations
PET-CT Injection Room	NMIR1	13.94	150	One per PET-CT Service. Includes two reclining chairs and injection storage area.
PET-CT Dedicated Laboratory	LBRP1	13.94	150	One per PET-CT Service.

##### **NUCLEAR MEDICINE STAFF AND ADMINISTRATIVE AREAS**

Director, Nuclear Medicine	OFDR1	13.01	140	One per Nuclear Medicine Department
Secretary with Visitor Waiting	SEC01	11.15	120	One per projected FTE secretary.
Provider's Office	OFDR1	11.15	120	One per projected FTE provider.
Resident's Office	OFDR1	11.15	120	One per projected nuc med trainee (includes residents or Fellows).
NCOIC/LCPO/LPO/SMT	OFA01	11.15	120	One per clinic. Standard furniture
	OFA02			System furniture
Director, Radio-immunoassay Laboratory	OFA01	11.15	120	Per projected FTE director. Standard Furniture
	OFA02			System Furniture.
Physicist Office	OFA01	11.15	120	One per projected FTE Physicists. Standard Furniture
	OFA02			System Furniture.
Radio-Pharmacist Office	OFA01	11.15	120	One per projected FTE Radio-pharmacists.
	OFA02			
Chief Technician	OFA01	11.15	120	One per clinic when FTE projected.
	OFA02			

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#### NUCLEAR MEDICINE STAFF AND ADMINISTRATIVE AREAS Continued

Administrative Cubicle	OFA03	5.57	60	Per projected FTE administrative personnel requiring a dedicated cubicle
Conference Room	CRR01	23.23	250	Minimum. See section 2.1.
Non-Residency Viewing/Consultation Area	XVC01	11.15	120	Minimum of one. Provide one per two imaging rooms.
Residency Viewing/Consultation Area	XVC01	23.23	250	Minimum or 60 nsf per imaging room.
Tele-Nuclear Medicine	XVC01	22.30	240	If in clinic concept of operations
Staff Lounge	SL001	13.01	140	Minimum. Maximum 200. Add 10 nsf per FTE staff on peak shift greater 10.
Staff Toilets (GP)	TLTU1	5.57	50	Minimum for FTE staff on peak shift greater 15. See Section 6.1 for increase in size and for male/female breakdown.
Personal Property Lockers (GP)	LR001	1.86	20	Lockers for personal property. See Section 6.1 for increase in size or for Changing Locker Room criteria.

#### NUCLEAR MEDICINE SUPPORT AREAS

Radium Cart Holding	NMRC1	5.57	60	One per clinic
Equipment Storage	SRE01	9.29	100	Minimum of 100 nsf or 40 nsf per imaging room. Maximum of 200 nsf.
Hot Locker/Dose Calibration	NMDC1	9.29	100	One per clinic. Provide only if there is no radio-pharmacy in the facility.
Radio-Pharmacy	NMRP1	18.58	200	One per clinic. Add 100 nsf at Medical Centers.
Decay Storage	NMDS1	11.15	120	One per clinic.
Film Sorting Area	XFSA1	16.72	180	One per clinic.
Soiled Utility	USCL1	11.15	120	One per clinic.
Clean Supply/Equipment Storage	SRSE1	18.58	200	One per imaging room.
Litter and Wheelchair Storage	SRLW1	5.57	60	One per clinic.
Crash Cart Alcove	RCA01	1.86	20	One per clinic.
Clean Cart Holding	CHC01	1.86	20	One per clinic.
Soiled Cart Holding	CHS01	1.86	20	One per clinic.

#### RADIOTHERAPY:

#### RADIOTHERAPY RECEPTION/PATIENT AREAS

Reception	RECP1	13.01	140	One per Radiotherapy service.
Uptake Room	NMUR1	15.80	170	One per clinic
Treatment Room	TRGM1	16.26	175	One per clinic.
Radio-Immunoassay Lab	LBRI1	11.15	120	One per clinic.
Exam Room	EXRG1	11.15	120	Army. One per clinic.
	EXRG2			Navy. One per clinic.
	EXRG3			Air Force/VA. One per clinic.

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### Radiology and Nuclear Medicine

#### **RADIOTHERAPY RECEPTION/PATIENT AREAS Continued**

Dressing Room/Cubicle	DR001	4.65	50	One per Linear Accelerator.
Sub-Waiting Room “Hot”	NMWR1	11.15	120	Minimum. Add 40 nsf for every Treatment room, Simulator and Treatment Planning room in excess of 3.
Toilet “Hot”	TLTU1	4.65	50	One per clinic.
Sub-Waiting Room “Cold”	WRC01	11.15	120	Minimum. Add 40 nsf for every Treatment room, Simulator and Therapy Planning room in excess of 3.
Toilet “Cold”	TLTU1	4.65	50	One per clinic.
Inpatient Holding	WRL01	5.57	60	Provide if Hospital or Medical Center.

#### **LINEAR ACCELERATOR**

Linear Accelerator:	XTLA1	55.74	600	Justification required for this service. Need to determine what type of Linear Accelerator will be used
LA Control Area	XTLC1	12.08	130	One per linear accelerator.
LA Entrance Maze	XTEM1	13.01	140	One per linear accelerator. Note: Maze design may be omitted with the use of a specifically designed, shielded sliding door.
LA Supply Storage	SRS01	16.72	180	One per linear accelerator
LA System Component Room	XTLE1	11.15	120	One per linear accelerator.
Daylight Film Processing	XFP03	11.15	120	One per radiologic physics lab.
Simulator:	XTSG1	37.17	400	Justification required for this service.
Simulator Control Room	XTSC1	10.22	110	Control area needed for scanning fluoro as well as personnel protection. Space needed for computer console and CPU.

#### **RADIOTHERAPY STAFF AND ADMINISTRATIVE AREAS**

Provider’s Office	OFA01	11.15	120	One per provider FTE projected.
	OFA02			
NCOIC/LCPO/LPO/SMT Office(s)	OFA01	11.15	120	One per NCOIC. This may include one for radiation oncology and one for medical physics, if FTEs projected.
	OFA02			
Resident Cubicle	OFA03	5.57	60	One per projected Radiotherapy resident or Fellow.
Staff Radiotherapist’s Office	OFDR1	11.15	120	One per radiotherapist projected.
Physicist’s Office	OFA01	11.15	120	One office per projected FTE physicist.
	OFA02			
Nurse Manager’s Office	OFA01	11.15	120	One per nurse manger FTE projected.
	OFA02			
Chief Technician’s Office	OFA01	11.15	120	One per senior technician FTE projected.
	OFA02			
Administrative Cubicle	OFA03	5.57	60	One per admin FTE projected.
Radiology Safety Files	FILE1	9.29	100	Minimum per radiology service. Add 20 nsf for each physicist FTE.

## DoD Space Planning Criteria for Health Facilities

### Radiology and Nuclear Medicine

#### **RADIOTHERAPY STAFF AND ADMINISTRATIVE AREAS Continued**

Patient Records Storage	FILE1	16.72	180	Minimum. 180 nsf or 1 NSF per every 10 patient records maintained, whichever is greater.
Film File Room	XFFA1	16.72s	180	Fixed shelves. One per radiation therapy service.
	XFFA2	16.72	180	Moveable shelves.
Copy Room	RPR01	9.29	100	For Copier/Fax/Mailbox distribution.
Conference Room	CRR01	23.23	250	One per clinic.
Staff Lounge	SL001	13.01	140	Minimum. Add 10 NSF per FTE staff over 10. 200 NSF max.
Personal Property Lockers	LR001	1.86	20	Lockers for personal property. See Section 6.1 for increase in size or for Locker Room, Changing criteria.
Staff Toilets (GP)	TLTU1	5.57	50	Minimum for total clinic staff of at least 10. See Section 6.1 for increase in size and for male/female breakdown.

#### **RADIOTHERAPY TREATMENT SUPPORT**

Radium Treatment Storage /Preparation	XTRT1	27.87	300	One per radiation therapy service if a radiation oncologist FTE projected.
Treatment Planning Room	XTTP1	23.23	250	One if simulator service projected.
Brachytherapy Room	XTBT1	11.15	120	One per clinic.
Radiologic Physics Lab	XTLB1	27.87	300	One per clinic.
Radiation Mold/Fabrication Shop	XTMF1	20.44	220	One per clinic.
Crash Cart Alcove	RCA01	1.86	20	One per clinic.
Viewing/Consultation:				
Non-Residency Program	XVC01	11.15	120	Minimum. Provide one per two Linear Accelerators.
With Residency Program	XVC01	23.23	250	One per clinic.
Litter and Wheelchair Storage	SRLW1	5.57	60	One per clinic.
Equipment Storage	SRSE1	11.15	120	One per clinic.
Trash and Linen Collection	UTLC1	7.43	80	One per clinic.
Soiled Utility	USCL1	11.15	120	One per clinic.
Clean Utility	UCCL1	5.57	60	One per clinic.

## DoD Space Planning Criteria for Health Facilities

### Radiology and Nuclear Medicine

#### 5.4.6. FORMULAS:

Column A	Column C	Column D	Column E
Imaging Technology	Studies per Hour	Number of Studies per Year per machine	Minimum Studies to Justify One Machine
Normal Radiography	4	12,000	6,000
Normal Radiology unit is Free Standing	1	3,000	2,000
Fluoroscopy	1	1,250	400
Chest Imaging	5	12,480	8,000
Mammography	2	4,160	2,000
Mobiles and Portables	2.5	5,000	2,500
Ultrasound	1.33	2,660	1,330
CT	2	10,000	7,500
MRI	1	5,000	3,750

**Note:** the CT and MRI are based on more than the normal duty day. This assumes a minimum of two shifts per day and one on Saturday and Sunday. Straight radiology is based on more than an 8-hour day also.

**Calculation Method:** Select the imaging technology for which you desire to calculate the number required. Project the annual number of procedures. Divide the projected annual number of procedures by the appropriate number of studies per year per machine. Ensure projected number of studies exceeds the minimum studies needed to justify one machine shown in the last column. If not, the facility will need extra justification to provide that modality. Round up for decimals higher than 0.5.

**Example:** An MTF projects they will perform 2,000 fluoroscopy procedures per year. From Column D, we can see the MTF exceeds the minimum quantity of studies to justify one machine (400).

$$2,000 \text{ projected procedures} / 1,250 \text{ (Column C)} = 1.6$$

Rounding up for decimals higher than 0.5, the MTF would need 2 Fluoroscopy machines.

\*\* Number based on Technology Assessment / Requirements Analysis Team of USAMMA and validated by Air Force Manpower